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EXAMINER	
DICKERSON, CHAD S	

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2625	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/798,309	ISHIZAKA ET AL.	
	Examiner	**Art Unit**	
	CHAD DICKERSON	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 April 2012*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 11-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 11-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/12/2012 has been entered.

Response to Arguments

2. Applicant's arguments with respect to claims 1 and 11-14 have been considered but are moot in view of the new ground(s) of rejection. The amendment to the claims has necessitated a new ground(s) of rejection. However, the references of Iwasaki '403, Clark '856 and Omura '032 are still being applied to the claims. The Examiner has added the reference of Takahashi '756. The overall rejection relies on Iwasaki '403 as the primary reference instead of Watanabe, which was relied upon as the primary reference in the Final rejection. The Applicant has argued that the newly amended claims are not disclosed. With the newly applied reference of Takahashi '756 in combination with the previously applied references, the newly amended claim is disclosed. A brief explanation of the combination that discloses the new claim features is presented below.

The new claims present block information that is comprised of a plurality of color data, and the block information contains color change data that represents the end of data. The Iwasaki '403 reference partitions the memory within the print buffer in order to store the raster information according to color. The raster information is developed into bands that are stored and output to the printer. The bands are considered as block information, and band data is comprised of a certain color[1]. The Takahashi '756 reference is similar to the Iwasaki '403 reference since it also develops coded data into bands. However, the Takahashi reference acquires bands in a column manner with the column containing a plurality of color information[2]. This cures the deficiency of the primary reference since it not only still uses bands, but the secondary reference acquires a column, which is considered analogous to a block, with several pieces of color band information to be stored and eventually output by the printer. Therefore, the print data containing a block with the block including several color component data is disclosed.

Lastly, the feature regarding the color change code representing the end of data is taught by the previously applied reference of Clark '856. The reference of Clark uses DMA interrupts to represent the end of a color component within a print swath and it is also used to go at the end of a print swath before data changes to a new color. The color change code represents the end of color data for a particular swath[3]. Therefore, the claim limitation regarding the color change code representing the end of data is disclosed.

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[1] See Iwasaki '403 at col. 7, ll. 56-col. 8, ll. 9, col. 8, ll. 24-47 and col. 9, ll. 14-26.
[2] See Takahashi '756 at col. 13, ll. 61-col. 14, ll. 5 and col. 15, ll. 25-col. 16, ll. 15.
[3] See Clark '856 at col. 7, ll. 3-32.

Therefore, in view of the above explanations, the Examiner believes that the claim language is disclosed by the applied references.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1 and 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwasaki '403 (USP 6328403) in view of Takahashi '756 (USP 6164756), Clark '856 (USP 7265856) and Omura '032 (JP Pub 10-255032 (Pub Date: 9/25/1998)).

Re claim 1: Iwasaki '403 discloses *the preamble limitation of a printing apparatus that prints by scanning a print head with regard to a printing medium, said print head having ink of a plurality of colors* (i.e. <u>since this is a preamble limitation that is not recited in the body of the claim nor does it give any life or meaning to the overall claim, it is not given any patentable weight.</u> However, in the interest of compact prosecution, the Examiner would like to mention that the Iwasaki '403 reference contains the above feature by containing nozzles within print head cartridges as shown in figure 26. In figure 3A and

3B, a nozzle array is illustrated and figure 26 has several print heads that are of a different color next to one another; see col. 16, ll. 14-36) and said apparatus comprising:

a print buffer for being divided into a plurality of first regions corresponding with a scan direction of the print head (i.e. the invention discloses buffer areas within the RAM that store information particular to each color represented in an image. Figures 4, 7 and 13 show rasters stored within the buffers pertaining to the particular colors and these rasters are at identical print positions in the main scanning direction as 1-byte data. When viewing figures 7 and 13, the image data is printed at a position on the paper that mirrors the raster position stored within the print buffers; see col. 7, 56-col. 8, ll. 16),

each first region being divided into a plurality of second regions corresponding with color (i.e. like the Watanabe '289 reference, the Iwasaki '403 reference discloses a printing device receiving image information to process and print (same field of endeavor). However, shown in figures 7, 11 and 13, the RAM stores buffers associated with a particular color. When viewing figure 7, the layout of the print nozzles within a print head of a color ink-jet printer is displayed. In addition, figure 13 represents the first region stored in the print buffer that represents the first block of data. The 16 columns are divided into 4 colors and the first three bytes are black, the next three are cyan, etc. These represent a memory with a first region of 16 bytes or columns to by divided into separate color regions within a buffer; see col. 7, line 13 – col. 9, line 45),

reception means for sequentially receiving a plurality of block data corresponding to a first region (i.e. the print managing band developing means sequentially receives band or column data. The column or band data represents print information that is in the scan direction (main-scanning) of the print head; see col. 7, ll. 56-col. 8, ll. 9),

(42) The color ink-jet printer apparatus 602 receives print codes transmitted from the host computer 601 and stores them in the reception buffer 615. The stored print codes are analyzed by the code analyzing means 616 as print data expressed by 2 bits per color. The analyzed print data of the individual colors are developed by the print data developing means 617 and the developed data are stored in the print buffers 618Y, 618M, 618C, and 618K of the corresponding colors under the control of the developing band managing means 11004 to 11007.

(43) Each of these print buffers 618Y, 618M, 618C, and 618K is configured in units of storage areas for eight rasters. Also, these print buffers 618Y, 618M, 618C, and 618K store print data for eight rasters (to be referred to as a column hereinafter) at identical print positions in the main scanning direction as 1-byte data. Note that each pixel data of print data is expressed by 2 bits. The two bits of each pixel data are managed in units of bits, and when data are read out from the print buffers in units of columns (bits) and are printed, pixels are printed at a resolution of 360 dpi. Note that data for eight rasters will be referred to as one band hereinafter.

wherein the block data contains data corresponding to predetermined color (i.e. the different buffers store data that was analyzed and developed into the bands. The color data developed into bands is considered as predetermined color information; see col. 7, ll. 56-col. 8, ll. 9, col. 8, ll. 24-47 and col. 9, ll. 14-26), and

(46) The print data of the individual colors developed by the print data developing means 617 are transferred to and stored in

the print buffers 618K, 618C, 618M, and 618Y of the corresponding colors by the developing band managing means 11004 to 11007 of the corresponding colors. The first bands to be developed on the print buffers of the print data of the individual colors are assumed to be bands K1, C1, M1, and Y1. If k-1, c-1, m-1, and y-1 represent the previous developing positions corresponding to the individual colors, the current developing positions of band data correspond to the positions obtained by incrementing the previous positions by +1, i.e., Kk, Cc, Mm, and Yy. As a result of incrementing (+1), if k=5 is obtained, k=1 is set; if c=9 is obtained, c is reset to 1; if m=13 is obtained, m is reset to 1; and if y=17 is obtained, y is reset to 1. In this manner, the developing position of black print data changes in the order of K1, K2, K3, K4, K1, K2, K3, K4, K1, K2, K3, K4, . . . , the developing position of cyan print data changes in the order of C1, C2, C3, C4, C5, C6, C7, C8, C1, C2, C3, C4, . . . , the developing position of magenta print data changes in the order of M1, M2, M3, M4, . . . , M10, M11, M12, M1, M2, M3, M4, . . . , and the developing position of yellow print data changes in the order of Y1, Y2, Y3, Y4, . . . , Y14, Y15, Y16, Y1, Y2, Y3, Y4, ...

(52) As shown in FIG. 13, when the developing positions of print data of the individual colors are Kk, Cc, Mm, and Yy, the following head driving data of the corresponding colors are acquired, from the paper feed side, from the corresponding bands. That is, in black print data, the first, second, and third bytes are respectively acquired from bands K(k+1), K(k+2), and K(k+3). In cyan print data, the fifth, sixth, and seventh bytes are respectively acquired from bands C(c+1), C(c+2), and C(c+3). In magenta print data, the ninth, 10th, and 11th bytes are respectively acquired from bands M(m+1), M(m+2), and M(m+3). Furthermore, in yellow print data, the 13th, 14th, and 15th bytes are respectively acquired from bands Y(y+1), Y(y+2), and Y(y+3).

wherein the reception means receives data corresponding to first color and data corresponding to second color with a predetermined color order (i.e. in the system, the

printer receives image data within a code and develops this information into bands. The bands can correspond to black, cyan, yellow or magenta colors. The developing means can output several bands of black, cyan, etc. When developing print positions for the different colors, the byte order acquired that pertains to the colors is considered as a predetermined color order; see col. 7, ll. 56-col. 8, ll. 9, col. 8, ll. 24-47 and col. 9, ll. 14-26);

acquisition means for acquiring data from the block data (i.e. the raster or column data contains print data that is used for output on the printer device; see col. 7, ll. 56-col. 8, ll. 9, col. 8, ll. 24-47 and col. 9, ll. 14-26); and

storage control means for assigning block data to the first regions of the print buffer and for storing the data acquired by the acquisition means in second regions of the first regions and changing the second regions to storing on the basis of the color code (i.e. the system of Iwasaki discloses storing data in a storage means based on the color code analyzed and determined to be a specific type of information. The overall print buffer is made up of the four different color buffers. The sixteen bytes in figure 13 represent the scan direction of the print head as seen in figure 7. The memory shown in figure 13 shows different columns stored in the overall buffer in a manner that when printed mimics the print positions in the main scanning direction. With the first region being the overall printing direction of the bytes within the print buffer, the data from the rendered printed codes stored in their respective portions within the buffer are

considered as data stored within the second regions of the first region; see col. 6, ll. 16-38 and col. 7, line 13 – col. 9, line 46).

Therefore, in view of Iwasaki '403, it would have been obvious to one of ordinary skill at the time the invention was made to have the features of a print buffer for dividing storage area into a plurality of first regions in corresponding with a scan direction of the print head, each first region being divided into a plurality of second regions corresponding with color, wherein the block data contains data corresponding to color and storage control means for assigning block data to the first regions of the print buffer and for storing the data acquired by the acquisition means in second regions of the first regions and changing the second regions to storing on the basis of the color code, incorporated in the device of Watanabe '289, in order to store color information within a print buffer in RAM and having the storage position be identical to the print positions of the image data in the main scanning direction (as stated in Iwasaki '961 col. 8, lines 1-9).

However, Iwasaki '403 fails to teach a color change code representing an end of data, wherein the reception means receives data corresponding to first color and data corresponding to second color included in a single block with a predetermined color order.

However, this is well known in the art as evidenced by Takahashi '756. Like the primary reference, the invention of Takahashi '756 discloses acquiring raster or column data to print information of different colors (same field of endeavor).

Takahashi '756 discloses wherein the reception means receives data corresponding to first color and data corresponding to second color included in a single block with a predetermined color order (i.e. the system contains a column that stores several colors. The column is considered as a block and the column detects whether different colors are present within the column; see col. 13, ll. 61-col. 14, ll. 5 and col. 15, ll. 25-col. 16, ll. 15).

> (67) According to the present embodiment attaching importance to Bk characters, by using a process of detecting a null raster, the emergence of a connecting stripe in one character can be prevented. Since the process of detecting a null raster is to detect whether data is present or not, time required for the detection is short, and hence the detection can be executed concurrently when data is read from the host computer or when raster data is converted to column data or in other similar cases. Also, the present embodiment is easy in electrical construction and advantageous in terms of cost. Since black characters can be detected, the present embodiment is quite effective for one point color images.

> (85) FIG. 14 shows a sequence of detecting the number of color data coexisting with the Bk data in a raster of a record image and setting a printing method. First, at Step-1, print data is read and then stored temporarily in a storage medium such as RAM or the like. At Step-2, the number of data for each color is counted to see if a raster concerned contains color data. For this purpose, a bit indicative of whether a raster contains data for each color is set before or after each raster. As a result, it can be determined whether the data existing in the raster is Bk or color or the mixture thereof.

(87) At Step-12, a printing method is set according to N. The printing method conforms to a table shown in FIG. 15. At Step-13, whether print data is present is determined. If the print data is present, processing returns to Step-1 to repeat again the sequence of counting data in a column and setting a printing method. If the print data is absent, this sequence terminates.

(88) In the printing method setting table shown in FIG. 15, the number, N, of colors existing in a column corresponds to a printing method. When the number of colors coexisting with Bk is 0 or 1, mode 1 is elected. In this case, since bleeding is less likely to occur, 1-pass printing is adopted as mode 1 for educing printing time. When N is 2, there is some likelihood of bleeding, and hence mode 2 is selected for setting slightly slower 2-pass printing. When N is 3, i.e. when all three colors of Y, M and C coexist with Bk, mode 3 is selected for setting 3-pass printing. Thus, a printing method can be set according to the number of colors coexisting with Bk. In the present embodiment, a printing method is set as described above, but a printing method may be selected in a different way. Needless to say, multi-pass printing attaching more importance to fixing performance, for example, 4-pass printing, 8-pass printing or the like may be set.

Therefore, in view of Takahashi ‘756, it would have been obvious to one of ordinary skill at the time the invention was made to have the feature of wherein the reception means receives data corresponding to first color and data corresponding to second color included in a single block with a predetermined color order, incorporated in the device of Iwasaki ‘403, in order to count the number of colors within a raster or column (as stated in Takahashi ‘756 col. 15, ll. 35-44).

However, the combination of Iwasaki '403 and Takahashi '756 fails to specifically teach a color change code representing an end of data.

However, this is well known in the art as evidenced by Clark '856. The Clark '856 reference discloses outputting stored information within a printer, which is similar to the primary reference (same field of endeavor).

Clark '856 discloses a color change code representing an end of data (i.e. the system discloses DMA interrupts that are in the middle of different color components and at the end of the color segment; see col. 7, ll. 3-32).

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(29)    Additional benefits can be obtained by aligning the
segments with the DMA FIFOs in the printer ASIC so that DMA
transfers for all data streams can be completed at one time,
lessening the time requirements by reducing the interrupt
handler overhead. Referring now to FIGS. 8A and 8B, the
advantages of coordinating DMA interrupts are shown by
illustrating the consequence of two methods of scheduling DMA
interrupts, one without segment alignment and one with segment
alignment. In Method 1, illustrated in FIG. 8A, DMA interrupts
occur at each segment boundary in each color. So, there are nine
DMA interrupts: one at the start of cyan 811, one at the start
of 831 yellow, one at segment 812 cyan, two between segments 821
and 822 of magenta, two between segments of yellow (832 and
833), one at the end of 813 cyan, and one at the end of 823
magenta. In Method 2, illustrated in FIG. 8B, DMA interrupts
occur at the start and end of colors and at coordinated points
in the data streams. Therefore, there are six interrupts in
Method 2: one at the start of 841 cyan, one at the start of 861
yellow, two between color segments 862 and 863, one at the end
of 843 cyan, and one at the end of 853 magenta. The two
interrupts between color segments handle the DMA interrupts for
all three colors at the same time. This gives a maximum of six
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DMA interrupts per swath. By eliminating the number of DMA interrupts, the printer firmware spends less time managing the print DMA system and can use that time for other processing, such as data decompression. Reducing the number of interrupts also eases the burden on the interrupt controller and allows other interrupts in the system more opportunity to be serviced.

Therefore, in view of Clark '856, it would have been obvious to one of ordinary skill at the time the invention was made to have the features of a color change code representing an end of data, incorporated in the device of Iwasaki '403, as modified by the features of Takahashi '756, in order to have a DMA interrupt that is at the end of a print segment (as stated in Clark '856 col. 7, ll. 3-32).

Lastly, however, the above combination fails to specifically teach a color change code representing a color changing of data, and changing the second regions to storing on the basis of the color change code read by the acquisition means.

However, this is well known in the art as evidenced by Omura '032. Like the primary reference, the Omura '032 reference discloses an output device receiving color data for printing (same field of endeavor).

Omura '032 discloses changing the second regions to storing on the basis of the color change code read by the acquisition means (i.e. the system discloses changing the different areas in memory to store based on operations that occur to the image data. The image processing operations are found within the color change point data. The second part (3b) of the memory that stores the bitmap information along with the color change information can have reduction or expansion operations performed on the

bitmap data. When the system performs either operation, the image data is stored based on the color change point information that describes the location of the specific point of image data within the raster after image processing. This features changes the location within the second part (3b) to store image data information based on the Results_Locations information of the color change point data. The color change code is read by the image processing means; ¶ [13]-[15] and [18]-[20]).

[0013]The secondary memory 3 which has the color change point information storing part 3b which stores the bit image storage 3a and the color change point data mentioned later which hold the binary picture data used as a processing object as image-operations equipment is shown in t, having the data conversion means 1, the data conversion means 1 incorporates binary picture data from the bit image storage 3a, and is this ******** -- it changes into the color change point data in which the position of a color change point [in / for binary picture data / each of that raster line] is shown. For example, as shown in drawing 2 (a), 32 dots wide and 32-dot-long secondary image data are held at the bit image part storage 3a, and this secondary image data is changed into the color change point data in which the position of the color change point in every raster line is shown. the color on a raster line -- the black from white -- or while being specified that the position which changes from black to white is a change point as shown in drawing 2 (b), it is specified that the position at the tail end of a raster line is a change point, and the position of this change point is shown by color change point data. It is specified in the head position of each raster line with a white block being located as the thing.

[0014]The color change point data changed from binary picture data by the data conversion means 1 is stored in the color change point information storing part 3b. The color change point data stored in the color change point information storing part 3b is read by the image processing means 2, and the image processing means 2 performs image-operations processing of rotation, variable power (expansion, reduction), etc. to the read color change point data.

[0015]Once the color change point data in which image-operations processing was performed is stored in the color change point information storing part 3b, it is given to the output-data-form conversion method 4. The output-data-form conversion method 4 changes the color change point data in which image-operations processing was performed into the data of the data format which the output device 5 requires, and outputs it to the output device 5.

[0018]The color change point data in which the position of the color change point in each raster line of binary picture data is shown in reduction operation of this embodiment, It is expressed with Locations [Height] using the parameter counter for managing the parameter Height for managing the number of a raster line, and the number of the positions of a color change point, and [counter], This Locations [Height] and [counter] show the dot position of what position is a position of a color change point from that head in a Height position raster line. For example, as shown in drawing 5 (a), the position of six color change points exists in a Height position raster line, Locations [Height] and [counter =0] show that the 7th dot position is a position of the color change point to black [white] from the head in a Height position raster line, Locations [Height] and [counter =1] show that the 9th dot position is a position of the color change point from black to white from the head in a Height position raster line. Since it is specified in the head position of each raster line with a white block being located as the thing as mentioned above, if Couter is even numbers, Locations [Height] and [counter] will show the head position of a white block, but. When a black block is temporarily located in the head position of a raster line, it is Locations [Height] and [0]. It is referred to as =0. Thus, binary picture data is changed into the color change point data denoted by Locations [Height] and [counter], and this color change point data is stored in the change-point-information storage 3b in the data format of Locations [Height] and [counter].

[0019]On the other hand, the position of the color change point in the data, i.e., the raster line after reduction operation processing, after the reduction operation processing to the color change point data shown by Locations [Height] and [counter], It is expressed with Result_Locations [Height] and [counter]. Result_Locations [Height] and [counter] show the dot position of what position is a position of a color change point from the head in a Height position raster line like Locations [Height] and [counter]. Thus, it is expressed with Result_Locations [Height] and [counter] by the color change point data after reduction operation processing, and this color change point data, It is stored in the change-point-information storage 3b in the data format of Result_Locations [Height] and [counter].

[0020]In this reduction operation, the reducing process to the direction of a raster line and the reducing process to the direction which intersects perpendicularly with a raster line are performed. When 1/3 time as many reduction is performed in the reducing process to the direction of a raster line to the color change point data shown by Locations [Height] and [counter], for example in a Height position raster line, The value of Locations [Height] and [counter] is divided by 3, the value is rounded off, and it stores in Result_Locations [Height] and [counter]. At the example shown in this drawing 5 (a), it is Locations [Height] and [0]. It is Result_Locations [Height] and [0] to =7. =2 is obtained, It is [as opposed to / Locations [Height] and [1] / =9] Result_Locations [Height] and [1]. =3 is obtained.

Therefore, in view of Omura '032, it would have been obvious to one of ordinary skill at the time the invention was made to have the feature of changing the second

regions to storing on the basis of the color change code read by the acquisition means, incorporated in the device of Iwasaki '403, as modified by the features of Takahashi '756 and Clark '856, in order to have image data that conveys color change point information and modify the method of storing information based on the color change point information to improve the efficiency of utilizing the printer's storage capacity (as stated in Omura '032 ¶ [06]-[08]).

Re Claim 11: The teachings of Iwasaki '403 in view of Takahashi '756, Clark '856 and Omura '032 are disclosed above.

Iwasaki '403 discloses the apparatus according to claim 1, wherein the data acquired by the acquisition means is column data (i.e. the system contains a column acquiring means to acquire column data; see fig. 11, col. 7, ll. 32-55).

> (41) Print data developed by the print data developing means 617 are developed on print buffers 618Y, 618M, 618C, and 618K of the corresponding colors in units of bands by developing band managing means 11004, 11005, 11006, and 11007 of the corresponding colors. Reference numerals 11012, 11013, 11014, and 11015 denote output band managing means for managing to read out print data corresponding to the band position to be actually printed in units of colors from those stored in the print buffers of the corresponding colors and to output them to the printheads; and 11016, 11017, 11018, and 11019, column acquiring means for acquiring the column data to be printed from the print buffers of the corresponding colors in accordance with instructions from the output band managing means of the corresponding colors. Reference numerals 11028 to 11031 denote

mask pattern buffers that store pattern data for masking data in correspondence with the colors; 11024 to 11027, mask acquiring means for reading out the mask patterns to be actually used from the corresponding mask pattern buffers; and 11020 to 11023, AND means for logically ANDing the column data and mask patterns of the corresponding colors. The masked image data of the individual colors are output to the printheads that eject inks of the corresponding colors, via a data output means 11032.

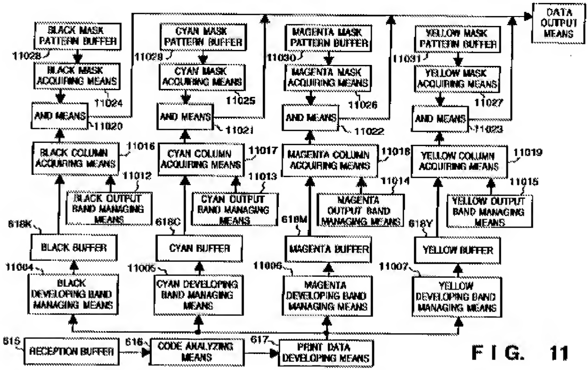

FIG. 11

Re Claim 12: The teachings of Iwasaki '403 in view of Takahashi '756, Clark '856 and Omura '032 are disclosed above.

Iwasaki ’403 discloses the apparatus according to claim 1, wherein said acquisition means has decompression means for decompressing the color component data into raster data (i.e. the system acquires code at the code analyzing means and the image data is developed into raster data at the print data developing means; see fig. 11, col. 7, ll. 32-55).

Re Claim 13: The teachings of Iwasaki ‘403 in view of Iwasaki '403, Clark ‘856 and Omura ‘032 are disclosed above.

However, Iwasaki ‘403 fails to specifically teach the apparatus according to claim 12, wherein said acquisition means has conversion means for converting the raster data into the column data.

However, this is well known in the art as evidenced by Takahashi ‘756. Like the primary reference, the invention of Takahashi '756 discloses acquiring raster or column data to print information of different colors (same field of endeavor).

Takahashi ‘756 discloses wherein said acquisition means has conversion means for converting the raster data into the column data (i.e. the system discloses converting raster data into column data; see fig. 3, see col. 13, ll. 61-col. 14, ll. 5).

> (67) According to the present embodiment attaching importance to Bk characters, by using a process of detecting a null raster, the emergence of a connecting stripe in one character can be prevented. Since the process of detecting a null raster is to detect whether data is present or not, time required for the detection is short, and hence the detection can be executed concurrently when data is read from the host computer or when raster data is converted to column data or in other similar cases. Also, the present embodiment is easy in electrical construction and advantageous in terms of cost. Since black characters can be detected, the present embodiment is quite effective for one point color images.

Therefore, in view of Takahashi ‘756, it would have been obvious to one of ordinary skill at the time the invention was made to have the feature of wherein said acquisition means has conversion means for converting the raster data into the column data, incorporated in the device of Iwasaki ‘403, in order to enable the feature of converting raster data into column information (as stated in Takahashi ‘756 col. 13, ll. 61-col. 14, ll. 5).

5. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iwasaki ‘403, as modified by the features of Takahashi ‘756, Clark ‘856 and Omura ‘032, as applied to claim 1 above, and further in view of Casey ‘499 (USP 6097499).

Re claim 14: The teachings of Iwasaki ‘403 in view of Takahashi ‘756, Clark ‘856 and Omura ‘032 are disclosed above.

However, Watanabe '289 in view of Iwasaki '403, Clark ‘856 and Omura ‘032 fails to specifically teach the preamble limitation of a print buffer having a column data amount stored that is smaller than the data that may be printed through one main scan of a print head.

However, this is well known in the art as evidenced by Casey '499. Casey '499 discloses the preamble limitation of a print buffer having a column data amount stored that is smaller than the data that may be printed through one main scan of a print head (i.e. The Watanabe reference involves having the printing device being connected to an external processing apparatus (see figure 8) and the Casey reference also involves an external device (i.e. a computer) that sends information to a printing device for printing (same field of endeavor). Casey '499 performs the feature of having a data amount that is stored in the buffer and this amount is smaller than the data amount required for a printing of one line in the main scanning direction; see column 5, lines 34-63).

Therefore, in view of Casey '499, it would have been obvious to one of ordinary skill at the time the invention was made to have the preamble feature of a column amount of the column data stored in the print buffer being smaller than a column amount of column data to be printed by one scanning, incorporated in the device of Watanabe, as modified by the features of Iwasaki '403, Clark ‘856 and Omura ‘032, in order to have a minimal buffer size in the printing system, while still being able to complete a printing pass during the print process (as stated in Casey '499 col. 4,lines 5-15).

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

7. Nohata '656 (USP 6111656) discloses an image communication apparatus that is able to acquire image data information and transfers the information within the equipment through several buffers and units for conversion before printing the image data.

8. Yamada (USP 6339480) discloses a printer driver for a color printer and the system comprises a raster to column conversion, a compression and a decompression of the raster data.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHAD DICKERSON whose telephone number is (571)270-1351. The examiner can normally be reached on 9:30-6:00pm Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Twyler Haskins can be reached on (571) 272-7406. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/CHAD DICKERSON/
Examiner of Art Unit 2625

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Supervisory Patent Examiner, Art Unit 2625